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Assessment of CO₂ Sequestration for Enhanced Recovery in Ohio

Updated oil-and-gas-fields maps of Ohio have been created using a geographic information system (GIS) to assess potential fields for CO₂ sequestration and CO₂-assisted enhanced recovery. This work was performed as part of the Midcontinent Interactive Digital Carbon Atlas and Relational Database (MIDCARB) project, a U.S. DOE-funded consortium of the Ohio, Kansas, Illinois, Indiana, and Kentucky state-geological surveys. This oil-and-gas-fields GIS has been linked to Ohio's oil-and-gas-well database, RBDMS, and oil-and-gas-production database, POGO, to permit greater flexibility of mapping and analyses. Individual oil-and-gas fields are grouped into eight major plays defined by producing horizon to enable better reservoir characterization for potential CO₂-sequestration zones. Each oil-and-gas field contains associated attributes, where available, such as reservoir characteristics (i.e. average depth, lithology, porosity, permeability, reservoir temperature, and net thickness), production data (i.e., cumulative production, original-oil-in-place, and remaining-oil-in-place), and fluid properties (i.e., oil gravity, oil viscosity, and average water saturation). Using this data, oil-and-gas fields can be screened for CO₂-sequestration and enhanced-recovery potential, and CO₂-storage capacity can be calculated. Oil samples from representative reservoirs throughout the state were collected to test the minimum miscibility pressure (MMP), one of the most critical screening factors for CO₂-enhanced-recovery projects. Initial test results for the Knox MMP is approximately 1500 psia, indicating many Knox reservoirs in eastern Ohio are potential candidates for CO₂ sequestration.